

DOMINION OBSERVATORY, WELLINGTON, NEW ZEALAND.

BULLETIN No. 78.

Notes on the History of the Date or
Calendar Line.



Reprinted from the *New Zealand Journal of Science and Technology*,
Vol. XI, No. 6, pp. 385-88, 1930.



WELLINGTON, N.Z.

BY AUTHORITY W. A. G. SKINNER, GOVERNMENT PRINTER

1930

NOTES ON THE HISTORY OF THE DATE OR CALENDAR LINE.

[This paper has been received through the Government Astronomer and Seismologist, Dr. C. E. Adams, from the Hydrographer to the Admiralty, London, with whose permission it is herewith republished.—ED.]

THE date or calendar line is defined in the Admiralty List of Lights as follows: "The date or calendar line is a modification of the line of the 180th meridian, and is drawn so as to include islands of any one group, &c., on the same side of the line. When crossing this line on a westerly (true) course the date must be advanced one day; and when crossing it on an easterly (true) course the date must be put back one day."

The reason for this procedure, and for the existence of the line in question, is that without some such compromise as it embodies it would be impossible to obtain any definite comparison between the local dates of two places separated by 180 degrees of longitude.

The civil day at any place is measured from midnight to midnight, local time, and it therefore follows that since London and Calcutta, for example, are 90 degrees of longitude apart, Monday, say, will begin and end at Calcutta six hours earlier than it will at London. Similarly, since Scott Island is 90 degrees east of Calcutta, Monday will begin and end six hours earlier at Scott Island than at Calcutta—or, in other words, 6 a.m. Monday at London and 6 p.m. Monday at Scott Island are contemporaneous.

But it may equally well be argued, by taking another intermediate station, such as New Orleans, six hours west of London and six hours east of Scott Island, that Monday begins and ends at Scott Island twelve hours later than at London—i.e., that 6 a.m. Monday at London really corresponds with 6 p.m. Sunday at Scott Island. Hence it would appear that at Scott Island 6 p.m. Sunday and 6 p.m. Monday occur at the same instant.

In fact, all reasoning on the lines of the above will always lead to two utterly irreconcilable results, both, *a priori*, equally probable. This duplication of dates can only be avoided by the adoption of some general convention giving the date of one locality a preference over that of another, or by the use of some universal standard day. The former is the method at present adopted by all nations.

The standard meridian taken is that of Greenwich, since that is the one which is adopted in practice. Theoretically, any meridian would be suitable, but it so happens that the march of events has made Greenwich the world's standard meridian, and that the date-line, where the change of date is made, is accordingly located in 180° east or west of Greenwich. It may be remarked that this location is an extremely fortunate one, since the 180th meridian traverses no continental land whatever except that of Antarctica and the extreme eastern point of Asia. The necessary change of date in the vicinity of this meridian, accordingly, causes a minimum of inconvenience.

But the adoption of the 180th meridian, pure and simple, as the date-line is undesirable, since it would cause differences of date to exist between contiguous islands forming part of one group, and closely united either politically or commercially, or both. Accordingly, the position of the line

has always been governed by these considerations, and has varied with the numerous changes of territorial ownership which have taken place in the Pacific: although, as will be seen, such changes as have been made in its position have, until now, always brought it more closely into conformity with the meridian of 180° .

It should be noted that the term "date-line" does not imply that such a line has ever been definitely laid down, either by any one Power or by international agreement. It is merely a method of expressing graphically and in a convenient form the differences of date which exist amongst some of the island groups of the Pacific. The line given in the publications of the Hydrographic Department is therefore only one among many possible lines, but it has obtained general acceptance, and approximates as closely as the conditions will allow to the meridian of 180° . It consists of a line drawn through the following positions:—

Lat.	Long.		Lat.	Long.
$60^{\circ} 00' \text{ S.}$	$180^{\circ} 00'$	to	$51^{\circ} 30' \text{ S.}$	$180^{\circ} 00'$
$51 \ 30$	$180 \ 00$	to	$45 \ 30$	$172 \ 30 \text{ W.}$
$45 \ 30$	$172 \ 30 \text{ W.}$	to	$15 \ 30$	$172 \ 30 \text{ W.}$
$15 \ 30$	$172 \ 30 \text{ W.}$	to	$5 \ 00$	$180 \ 00$
$5 \ 00$	$180 \ 00$	to	$48 \ 00 \text{ N.}$	$180 \ 00$
$48 \ 00 \text{ N.}$	$180 \ 00$	to	$52 \ 30$	$170 \ 00 \text{ E.}$
$52 \ 30$	$170 \ 00 \text{ E.}$	to	$65 \ 00$	$169 \ 00 \text{ W.}$

and through the centre of Bering Strait, joining the 180^{th} meridian in 70° N.

This line, and those preceding it, are shown on the chart opposite. The historical facts leading up to its adoption are as follows:—

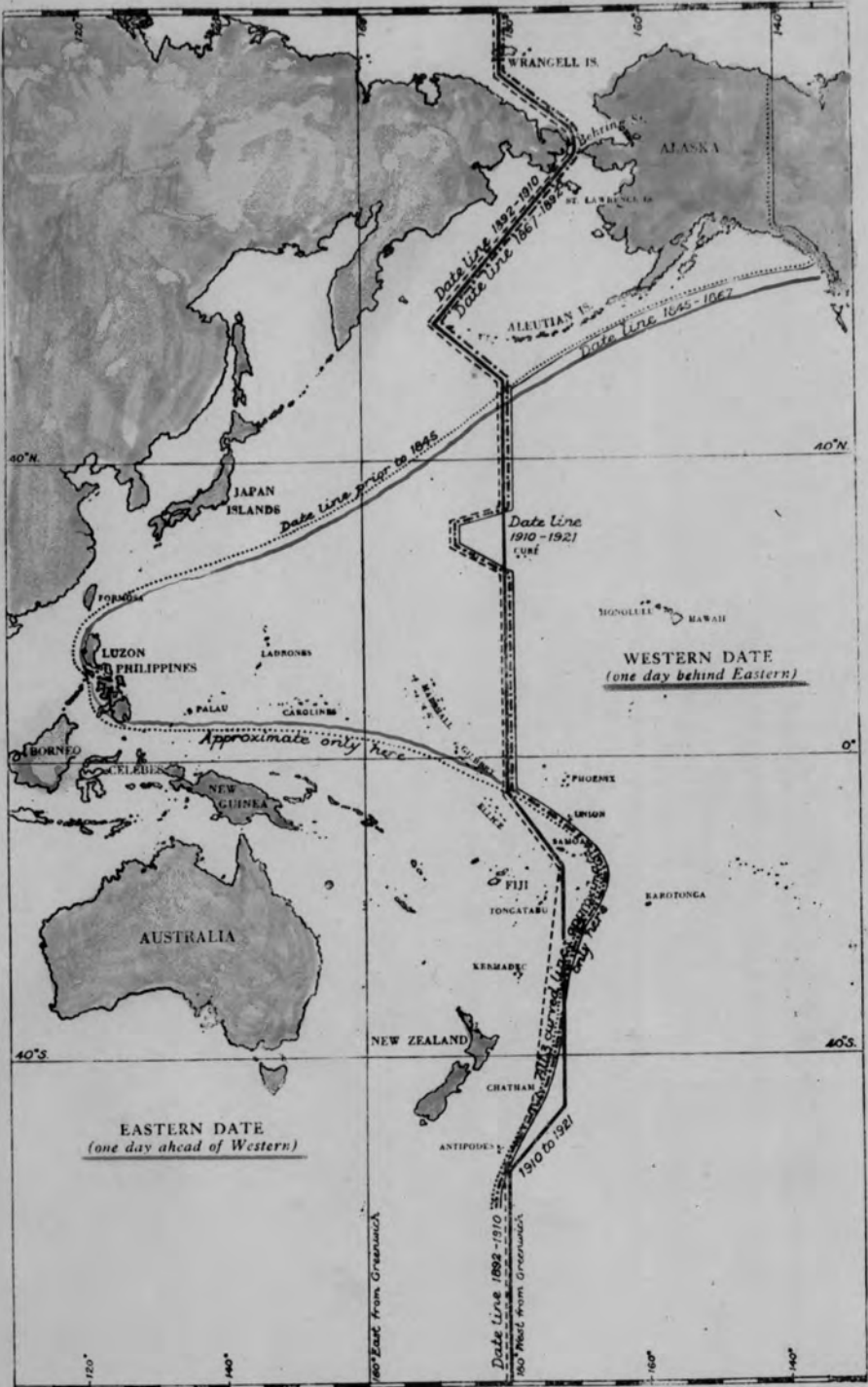
The question of a date-line first began to arise when the early navigators—English, French, Spanish, and Dutch—having sailed with, and preserved, the same local date, began to reach the Pacific by different routes, the Spaniards sailing westward and the remainder eastward. The colonies which they founded preserved the dates given by their prospective reckonings, and so it came about that in, for example, the Spanish colony of Luzon, and the Dutch colony of Celebes, in practically the same longitude, the same name was applied to a day beginning respectively twelve hours later, and twelve hours earlier, than the day of that name in Europe. In other words, the local date of Celebes was one day ahead of that of Luzon.

These dates are often distinguished by the names of "Asiatic date" and "American date," but the terms "eastern date" and "western date" appear preferable. The eastern date is one day ahead of the western date.

The Philippines continued to use the western date until 1844, and at that time the approximate position of the date-line was as shown by the dotted line on the chart. The eastern date was in use in Alaska, which then belonged to Russia, the western in the Carolines and Ladrões, and the eastern in Samoa and New Zealand.

On the 30th December, 1844, the Philippines adopted the eastern date, making the following day the 1st January, and the position of the date-line became approximately that shown by the thin continuous line. The indentation in about 25° N. was thoughtfully drawn around two islands, Morrell and Byers Islands, now known to be non-existent, but then believed to form part of the Hawaiian Group.

In October, 1867, Alaska was sold by Russia to America, and adopted the western date (and, in addition, the Gregorian calendar). The date-line had then to be amended so as to pass through Bering Strait and clear



the western extremity of the Aleutian Islands. This line is indicated by dot and dash.

On the 4th July, 1892, Samoa, which had previously used the eastern date, adopted the western for the whole of the group. This necessitated a further amendment in the position of the date-line. A pilot chart published by the United States Hydrographic Department in September, 1899, showed the position of the line in accordance with the latest information, and a practically identical line was published in the third edition of "Pacific Islands Pilot," Vol. 2, issued by this Department in 1900. This line is shown by dashes. In 1910 the position of the line was slightly amended, the indentation in the neighbourhood of Morrell and Byers Islands (no longer shown on the charts) being removed. At the same time the portion between Samoa and Chatham Islands was moved slightly eastward, so as to follow the meridian of $172^{\circ} 30' W$. These amendments were notified in the 1911 supplement to "Pacific Islands," Vol. 2, and have been generally accepted. The final position of the date-line, at the time of writing, is accordingly as shown by a thick continuous line on the chart. As has been stated, it is defined in the "Admiralty List of Lights," and in "Pacific Islands Pilot," Vol. 2, and is shown on Admiralty Chart 5006, "Time Zone Chart of the World."

Hydrographic Department, Admiralty,
November, 1921.

[300/3/30—18697